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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/356,532	07/19/1999	ELLIOT KARL KOLODNER	UK98093	7951

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EXAMINER	
NGUYEN, DUSTIN	
ART UNIT	**PAPER NUMBER**
2154	13

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/356,532	KOLODNER ET AL.	
	Examiner	Art Unit	
	Dustin Nguyen	2154	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 November 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-18,20,22,24 and 26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-18,20,22,24 and 26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. Claims 1, 3, 5-18, 20, 22, 24, and 26 are considered for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 5-9, 18, 20, 22, 24, 26 are rejected under 35 U.S.C. 103[a] as being unpatentable over Houlsdworth [US Patent No 6,304,949], in view of Joy [US Patent No 5,761,670].

4. As per claim 1, Houlsdworth discloses the method of managing memory in a multi-threaded processing environment including local thread stacks and local thread heaps, and a global heap, said method comprising:

creating an object in a thread heap [col 3, lines 12-27; and col 4, line 13-15];

assigning a status to the given object [i.e. flag] [col 5, lines 49-56],

Houlsdworth does not specifically disclose

the status designating the object as a local object; and

for a given thread, monitoring each object in the heap, to determine whether the object is accessible by any thread other than the given thread.

changing the status of the object to global when the monitoring step determines that the object is accessible from either of a global root or other global object.

Joy discloses

the status designating the object as a local object [272, Figure 4; and col 10, lines 54-56]; and

for a given thread, monitoring each object in the heap, to determine whether the object is accessible by any thread other than the given thread [col 1, lines 43-52].

changing the status of the object to global when the monitoring step determines that the object is accessible from either of a global root or other global object [Abstract; col 2, lines 58-63; and col 5, lines 38-48].

At the time the invention was made, it would have been obvious to a person skill in the art to combine Houlsdworth and Joy because Joy's teaching would allow to identify shared object to reduce memory requirement.

5. As per claim 3, Houlsdworth discloses deleting from the thread heap one or more local objects when it is determined that they are not accessible from a local root [i.e. garbage collection] [col 3, line 19-27; and col 7, lines 31-42].

6. As per claim 5, Houlsdworth discloses changing the status of an object in the thread heap to global if the object is assigned to a static variable or if the object is assigned to a field in a global object [set global flag] [col 5, lines 4-20 and lines 52-56].

7. As per claim 6, Houlsdworth does not specifically disclose intercepting assignment operations to an object in the thread heap to determine whether the object status should be changed. Joy discloses intercepting assignment operations to an object in the thread heap to determine whether the object status should be changed [i.e. change unlock to lock] [Abstract]. At the time the invention was made, it would have been obvious to a person skill in the art to combine the teaching of Houlsdworth and Joy because Joy's teaching would allow to reduce communication overhead.

8. As per claim 7, Houlsdworth teaches the multithreaded processing environment is a virtual machine [col 4, line 15-19].

9. As per claim 8, Houlsdworth does not specifically disclose a interpreter comprises a write operation code modified to perform a checking of assignment of the object. Joy discloses a interpreter comprises a write operation code modified to perform a checking of assignment of the object [col 4, lines 14-22]. At the time the invention was made, it would have been obvious to a person skill in the art to combine the teaching of Houlsdworth and Joy because Joy's teaching would allow to verify the integrity of all the bytecode programs in the loaded object class [Joy, col 4, lines 32-34].

10. As per claim 9, Joy discloses a just in time compiler wherein native compiled write operation code includes native code to perform the checking of assignment of the object [col 4, lines 23-27].

11. As per claim 18, it is rejected for similar reasons as stated in claim 1. Furthermore, Houlsdworth discloses a local thread stacks and heaps, and a global heap [col 4, lines 24-58].

12. As per claim 20, it is rejected for similar reason as stated above in claim 3.

13. As per claims 22, 24 and 26, they are rejected for similar reasons as stated above in claims 1, 3, and 5. Furthermore, Houlsdworth mentions the method above can be performed in a computer program [Abstract].

14. Claims 10–13 are rejected under 35 U.S.C. 103[a] as being unpatentable over Houlsdworth [US Patent No 6,304,949], in view of Joy [US Patent No 5,761,670], and further in view of Spilo et al. [US Patent No 6,351,794].

15. As per claim 10, Houlsdworth and Joy do not specifically disclose the spare capacity in an object header for the status. Spilo discloses the spare capacity in an object header for the status [Figure 2; and col 5, lines 45-58]. At the time the invention was made, it would have been obvious to a person skill in the art to combine the teaching of Houlsdworth, Joy and Spilo because Spilo's teaching would allow to reserve the availability of memory space for additional task to be performed.

16. As per claim 11, Spilo discloses using multiples of 2 or more bytes in a thread heap to store the objects whereby there is at least one spare bit in the object length variable and using the at least one spare bit as the status [memory] [74, Figure 5; and col 5, lines 45-col 6, lines 2].

17. As per claim 12, Spilo discloses moving objects whose status is global from the thread heap to the global heap [Figure 5; and col 11, lines 33-39].

18. As per claim 13, Houlsdworth discloses compacting the reachable local objects in a thread heap [col 2, line 49-65].

19. Claims 14-17 are rejected under 35 U.S.C. 103[a] as being unpatentable over Houlsdworth [US Patent No 6,304,949], in view of Joy [US Patent No 5,761,670], and further in view of Potter et al. [US Patent No 5,924,093].

20. As per claim 14, Houlsdworth and Joy do not specifically disclose certain objects are associated with a global status on creation thereof. Potter discloses certain objects are associated with a global status on creation thereof [28, Figure 2A]. At the time the invention was made, it would have been obvious to a person skill in the art to combine the teaching of Houlsdworth, Joy and Potter because Potter's teaching would reduce overhead to increase system performance.

21. As per claim 15, Houlsdworth discloses certain objects include class objects [col 4, line 40-46].

22. As per claim 16, it is rejected for similar reasons as stated above in claim 14. Furthermore, Houlsdworth does not specifically disclose the step of analyzing whether an object is likely to be made global. Joy discloses the step of analyzing whether an object is likely to be made global [recently lock] [col 4, lines 65-col 5, lines 11; and col 2, lines 58-64]. At the time the invention was made, it would have been obvious to a person skill in the art to combine the teaching of Houlsdworth, and Joy because Joy's teaching would allow to determine shared resource dynamically and increase space availability for memory allocation.

23. As per claim 17, Potter discloses the allocating objects assigned as global on creation to the global heap [28, Figure 2A].

24. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dustin Nguyen whose telephone number is (703) 305-5321. The examiner can normally be reached on Monday – Friday (8:00 – 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Follansbee can be reached on (703) 306-8498.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directly to the receptionist whose telephone number is (703) 305-3900.

Dustin Nguyen

JOHN FOLLANSBEE
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TECHNOLOGY CENTER 2100